

many of the questions I have asked over the years and even some that I had yet to realise I had—until their answers were revealed in the book. The comparison of otariid morphology is extremely useful to all who have ever wondered which species of fur seal they have encountered.

Grey-scale figures and tables scattered throughout the book enhance the discussion in the text but the colour plates near the end of the book are particularly appealing. These illustrate well the information provided in the text, and are at once fascinating and confronting. They include photos of seals at play on land, in the water and beneath the surface, a visual comparison of different age and sex classes of the three species, and the birthing of a pup. One

plate even offers a rare glimpse of an Australian sea lion instrumented with a crittercam at sea. Several photos of seals entangled in a variety of materials reinforce the impacts of humans on seals, and some of the issues facing the conservation and management of these charismatic marine animals.

Overall, I found this book thoroughly enjoyable; it was easy to read, relevant and engaging. It would complement any natural history library and I recommend it to anyone with an interest in marine mammals, as well as anyone without—this book will surely pique the interest of even the most indifferent reader.

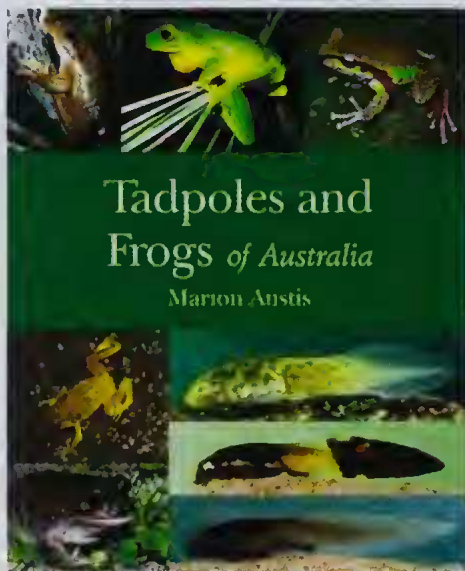
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Tadpoles and Frogs of Australia

by Marion Anstis

Publisher: *New Holland, Sydney. 2013.*
831 pages, hardcover, colour photographs,
monochrome technical drawings, ISBN
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limited edition, ISBN 9781921517167, signed,
individually numbered)

Few natural processes engage the young (and not-so-young) budding zoologist as much as the triphasic lifecycle of a typical frog. From egg to tadpole to young frog, many have watched in wonder. So it is a little surprising that guides to Australian frogs typically provide only cursory mention of the eggs and tadpoles of each species. That changed around a decade ago when Marion Anstis produced the first definitive guide to the eggs and larvae of a cohort of Australian frogs: *Tadpoles of South-eastern Australia: A Guide with Keys*. Although that book 'raised the bar' for amphibian field guides in this country, Anstis was not satisfied by either the modern crop of frog books, or even her own seminal work. She was determined to produce a book that covered in detail all lifecycle



phases of *all* Australian amphibians—a monumental task! *Tadpoles and Frogs of Australia* is the culmination of that vision. This book is not intended to be a field guide—it is a full-blown, comprehensive reference book, and has the physical stature to match. It is wonderfully large and heavy and, in an era of e-books and online publications, for a bibliophile like me this tome

is as much a joy to hold as it is to behold! It won't fit in the glove-box of most vehicles, and it will quickly tire the fittest fieldworkers should they carry it into the field—although I have no doubt that many keen herpetologists will have this book on the back seat of their field vehicle.

As well as the usual preliminaries, including a glossary (which is a necessity—I certainly didn't know the meaning of 'nidicolous!'), the book is divided into three parts. Part 1 'Preliminary background' commences with frog classification, before detailing the 46 developmental stages for aquatic tadpoles, from fertilised egg to fully metamorphosed frog (as well as a separate section for those fewer species that develop in terrestrial or semi-terrestrial environments). The collection and raising of eggs and tadpoles is explained, and predators of tadpoles are described. Conservation issues relevant to amphibians are covered—a pressing topic in an era of catastrophic losses and declines of amphibians. Conservation is a theme repeated throughout the book, and Anstis can rest assured that this book will be an immensely valuable tool for conservation biologists throughout Australia.

Part 2 'A look at features' provides detailed coverage of morphology and features for each of the lifecycle phases typical of frogs, and includes the oral disc, an important diagnostic feature of many tadpoles. A key to the genera of tadpoles is included, as is a guide to the types of egg clusters. The key is necessarily technical, but it is underpinned by matching explanatory detail throughout the book, and the guide to egg clusters—accompanied by photographs of the 23 types—is enormously valuable for identifying species or genera when adults and tadpoles are not conspicuous, or cannot be observed closely, at breeding sites.

Part 3 'Life histories' contains identification keys for the eggs and tadpoles of each genus, followed by meticulously detailed profiles of most species of Australian frogs. Rather than selecting a random profile to describe here, for sentimental reasons I turned to a species named in honour of Victorian frog legend Murray Littlejohn. The profile of *Litoria littlejohni* contains

three photographs of adult frogs, photographs of the lateral, dorsal and ventral surfaces of the tadpole, another of the tadpole's mouthparts, photographs of an egg cluster and a juvenile frog, and beautifully detailed technical drawings of the tadpole and its mouthparts. There is a distribution map, which details breeding sites of *L. littlejohni*, a description of the adult frog, and seasonality and type of mating call. Embryos are described, including the type of egg clutch (referenced to the earlier egg cluster guide), followed by descriptions of the ovum, capsule and hatchlings. Tadpoles are described, including size and detail of the tadpole's body and oral disc. Seasonal timing of metamorphosis is provided, along with a description of the behaviour of tadpoles. Finally, there is a section to help differentiate between similar species. Incredibly, this coverage is extended to a further 214 species! This is slightly less than the total number of described Australian frogs (241); the remainder are species for which relevant information was not available at the time of writing.

The publisher tells us that there are 3060 photographs and drawings; I did not try to verify this, but there is no question that every topic and species is illustrated with high quality images. The retail price is not a trifling amount, and before I saw this book I wondered whether it would be worth the outlay. Having had time to appreciate the quality, scale, scope and usefulness of this book, I believe it is actually a terrific bargain. Is the book flawless? Of course not. But pointing out rare (and very minor!) typographical errors feels a little like noting an errant paintbrush hair on the ceiling of the Sistine Chapel. In short this is a landmark book by a remarkable natural historian and scientist. It is an instant classic, and the new bible of Australian frogs.

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